

Name: _____

PC: Solving Multivariable Linear Systems

Date: _____

Ms. Loughran

Do Now

Solve each of the following systems algebraically:

1.
$$\begin{aligned} 8x - 4y &= 4 \\ 4x - 2y &= 2 \end{aligned}$$

2.
$$\begin{aligned} 3x - 6y &= 9 \\ -2x + 4y &= 1 \end{aligned}$$

Model

1. Solve algebraically:
$$\begin{aligned} x - 2y + 3z &= 9 \\ -x + 3y &= -4 \\ 2x - 5y + 5z &= 17 \end{aligned}$$

Answer is an ordered triple (, ,)

Remember for a system of linear equations, exactly one is true:

1. There is exactly one solution
2. There are infinitely many solutions.
3. There is no solution.

For 2-6, solve the system of linear equations.

$$3x - 2y + 4z = 1$$

2. $x + y - 2z = 3$

$$2x - 3y + 6z = 8$$

$$4x + y - 3z = 11$$

$$3. \quad 2x - 3y + 2z = 9$$

$$x + y + z = -3$$

$$x + y - 3z = -1$$

$$4. \quad y - z = 0$$

$$-x + 2y = 1$$

$$x + y + z = 5$$

5. $-4x + 2y - 3z = -9$

$$2x - 3y + 2z = 5$$

$$x + y - 5z = 3$$

6. $x - 2z = 1$

$$2x - y - z = 0$$

Practice
(Courtesy of Kuta Software)

Solve each system by elimination.

$$\begin{aligned} 1) \quad & -x - 5y - 5z = 2 \\ & 4x - 5y + 4z = 19 \\ & x + 5y - z = -20 \end{aligned}$$

$$\begin{aligned} 2) \quad & -4x - 5y - z = 18 \\ & -2x - 5y - 2z = 12 \\ & -2x + 5y + 2z = 4 \end{aligned}$$

$$\begin{aligned} 3) \quad & -x - 5y + z = 17 \\ & -5x - 5y + 5z = 5 \\ & 2x + 5y - 3z = -10 \end{aligned}$$

$$\begin{aligned} 4) \quad & 4x + 4y + z = 24 \\ & 2x - 4y + z = 0 \\ & 5x - 4y - 5z = 12 \end{aligned}$$

$$\begin{aligned} 5) \quad & 4r - 4s + 4t = -4 \\ & 4r + s - 2t = 5 \\ & -3r - 3s - 4t = -16 \end{aligned}$$

$$\begin{aligned} 6) \quad & x - 6y + 4z = -12 \\ & x + y - 4z = 12 \\ & 2x + 2y + 5z = -15 \end{aligned}$$

$$\begin{aligned} 7) \quad & x - y - 2z = -6 \\ & 3x + 2y = -25 \\ & -4x + y - z = 12 \end{aligned}$$

$$\begin{aligned} 8) \quad & 5a + 5b + 5c = -20 \\ & 4a + 3b + 3c = -6 \\ & -4a + 3b + 3c = 9 \end{aligned}$$

$$\begin{aligned} 9) \quad & -6r + 5s + 2t = -11 \\ & -2r + s + 4t = -9 \\ & 4r - 5s + 5t = -4 \end{aligned}$$

$$\begin{aligned} 10) \quad & -6x - 2y + 2z = -8 \\ & 3x - 2y - 4z = 8 \\ & 6x - 2y - 6z = -18 \end{aligned}$$

$$\begin{aligned} 11) \quad & 5x - 4y + 2z = 21 \\ & -x - 5y + 6z = -24 \\ & -x - 4y + 5z = -21 \end{aligned}$$

$$\begin{aligned} 12) \quad & 6r - s + 3t = -9 \\ & 5r + 5s - 5t = 20 \\ & 3r - s + 4t = -5 \end{aligned}$$

$$\begin{aligned} 13) \quad & -3a - b - 3c = -8 \\ & -5a + 3b + 6c = -4 \\ & -6a - 4b + c = -20 \end{aligned}$$

$$\begin{aligned} 14) \quad & -5x + 3y + 6z = 4 \\ & -3x + y + 5z = -5 \\ & -4x + 2y + z = 13 \end{aligned}$$

$$\begin{aligned} 15) \quad & 3a - 3b + 4c = -23 \\ & a + 2b - 3c = 25 \\ & 4a - b + c = 25 \end{aligned}$$

$$\begin{aligned} 16) \quad & -6x - 2y - z = -17 \\ & 5x + y - 6z = 19 \\ & -4x - 6y - 6z = -20 \end{aligned}$$